UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Northwest Region
7600 Sand Point Way N.E., Bldg. 1
Seattle, WA 98115

March 4, 2003

Lawrence C. Evans
Portland District, US Army Corps of Engineers
PO Box 2946
Portland, OR 97208

RE: Endangered Species Act Section 7 Formal Consultation and Magnuson-Stevens Act Essential Fish Habitat Consultation, Pringle Creek Commercial Street Weir and Fish Ladder Reconstruction, Salem, OR (Corps No. 2002-00269; NMFS Consultation No. F/NWR/2002/01912)

Dear Mr. Evans:

Enclosed is a biological opinion prepared by the National Marine Fisheries Service (NOAA Fisheries) pursuant to Section 7 of the Endangered Species Act (ESA) for the Commercial Street Weir and Fish Ladder Reconstruction on Pringle Creek in Salem, Oregon. NOAA Fisheries concludes that the proposed action is not likely to jeopardize Upper Willamette River chinook salmon or steelhead. Pursuant to Section 7 of the ESA, NOAA Fisheries has included reasonable and prudent measures and non-discretionary terms and conditions that are necessary and appropriate to minimize the potential for incidental take associated with this project. Included in the ESA biological opinion is a consultation on the effects of the proposed action on Essential Fish Habitat, pursuant to section 305(b) of the Magnuson-Stevens Fishery Conservation and Management Act and its implementing regulations (50 CFR Part 600).

Questions regarding this letter should be directed to Mindy Simmons of my staff at 503-872-2854.

Sincerely,

D. Robert Lohn
Regional Administrator

cc: Richard Craven, Craven Consulting
Larry Magura, Black and Veatch Corporation
Ken Roley, City of Salem

Endangered Species Act
Section 7 Consultation

Biological Opinion

and

Magnuson-Stevens Fishery Conservation and Management Act Consultation

Pringle Creek-Commercial Street Bridge Weir and Fish Ladder Replacement
Salem, Oregon

Action Agency:	US Army Corps of Engineers
Log Number:	F/NWR/2002/01912
Consultation Conducted By:	NOAA Fisheries Northwest Region Hydropower Division
Date Issued:	March 4, 2003

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1. ENDANGERED SPECIES ACT

1.1 Background

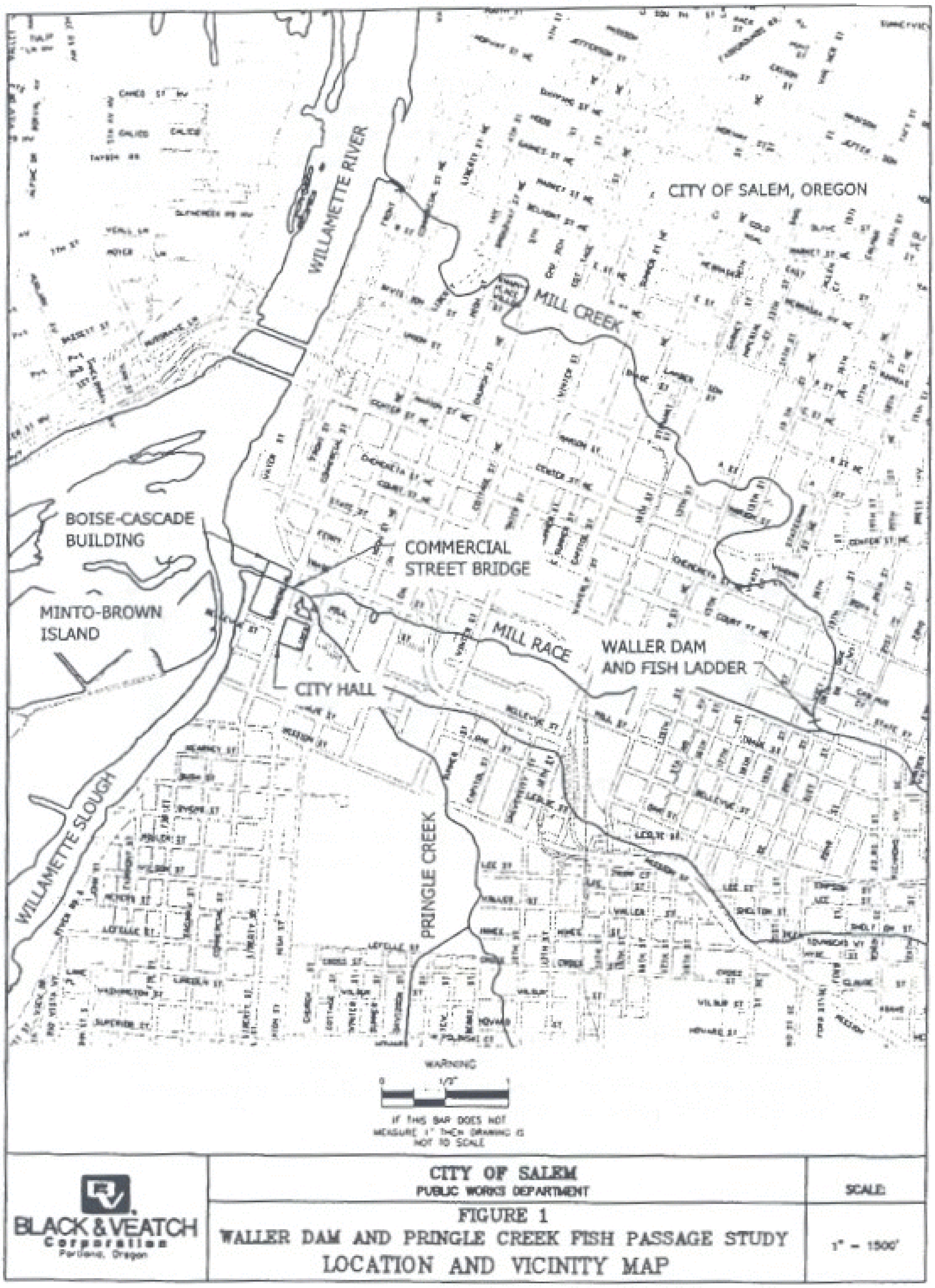
On June 18, 2002, National Marine Fisheries Service (NOAA Fisheries) received a request for Endangered Species Act (ESA) Section 7 consultation from the U.S. Army Corps of Engineers (USACE) for the reconstruction of the Commercial Street Bridge Weir and Fish Ladder on Pringle Creek in the city of Salem in Marion County, Oregon. The Biological Assessment (BA) provided by the USACE (2002) with the request for consultation determined that the proposed activities covered would be likely to adversely affect anadromous fish species listed under the ESA. The objective of this biological opinion (BO) is to determine whether the proposed action is likely to jeopardize the continued existence of Upper Willamette River (UWR) chinook salmon or UWR steelhead.

The Willamette River supports UWR chinook salmon (*Oncorhynchus tshawytscha*) and UWR steelhead (*O. mykiss*). UWR chinook salmon were listed as threatened under the ESA by NOAA Fisheries on March 24, 1999 (64 FR 14308). UWR steelhead were listed as threatened under the ESA by NOAA Fisheries on March 25, 1999 (64 FR 14517). Protective regulations for both species were issued under Section 4(d) of the ESA on July 10, 2000 (65 FR 42422). NOAA Fisheries designated critical habitat for both species on February 16, 2000 (65 FR 7764), and withdrew both designations by consent decree on April 30, 2002.

1.1.1 Project History and Description

The City of Salem (City) owns the Commercial Street Bridge Weir on Pringle Creek in downtown Salem. This portion of Pringle Creek flows under the Commercial Street Bridge and Boise Cascade Building for 300 feet prior to daylighting on the west side of the building (Figure 1). In the early 1990s, water velocities in Pringle Creek during high-flow events began to scour bed material away from structural footings of the Commercial Street Bridge. In 1995, the City constructed the Commercial Street Bridge weir so that gravel would accumulate in the creek bed, increasing the creek bed elevation and thereby protecting bridge support columns from further undercutting. The concrete-capped gabion weir, as constructed, measured approximately 3 ft high and 50 ft wide, with a 5-ft wide slot in the middle of the crest to concentrate low flows over the center of the weir. The City also constructed a gabion fish ladder in the center of the weir, but this ladder washed out during a flood in February 1996. The City investigated the feasibility of rebuilding this fish ladder to enhance passage for adult salmon, steelhead, and resident fish over the existing concrete-capped gabion weir. Black and Veatch Corporation and Craven Consulting Group evaluated the existing gabion fish ladder, and recommended replacing it with a pool-and-weir fish ladder (Black and Veatch Corporation and Craven Consulting Group 2002). The City submitted design plans for a new concrete pool-and-weir fish ladder to the USACE in June 2002.

On July 2, 2002, NOAA Fisheries was notified by Richard Craven of Craven Consulting Group that the existing weir was failing (Craven 2002). Given the likelihood that the weir would continue to fail in subsequent high water events, the City elected to completely remove the remaining portions and to reconstruct the weir from solid concrete. Thus, the USACE's proposed action is to issue a 404 permit to the City for replacement of both the failing weir and fish ladder.


CITY OF SALEM, OREGON
WILLAMETTE RIVER
MILL CREEK
BOISE-CASCADE BUILDING
COMMERCIAL STREET BRIDGE
MINTO-BROWN ISLAND
MILL RACE
WALLER DAM AND FISH LADDER
CITY HALL
WILLAMETTE SLOUGH
PRINGLE CREEK
WARNING
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE
BLACK & VEATCH Corporation Portland, Oregon
CITY OF SALEM
PUBLIC WORKS DEPARTMENT
SCALE:
FIGURE 1
WALLER DAM AND PRINGLE CREEK FISH PASSAGE STUDY
LOCATION AND VICINITY MAP
1" = 1500'

Figure

1. Lower Pringle Creek, including the project location at the Commercial Street bridge.

1.2 Proposed Action and Action Area

1.2.1 Project Description

The proposed action includes permitting the construction of a cofferdam, complete demolition and removal of the existing gabion weir and associated debris, demolition and removal of a concrete box vault and concrete waterline, construction of a new reinforced concrete weir, and construction of a new pool-and-weir fish ladder. The new pool-and-weir fish ladder will be approximately 80 ft long by 15 ft wide, covering an area of approximately 0.03 acres. The proposed ladder will consist of 9 pools, with inside dimensions of approximately 12 ft long by 8 ft wide. The water depth in the pools will be approximately 3.5 ft, with a 6-in.drop between pools. The ladder will extend downstream from the center of the weir, parallel to streamflow. The top pool will be located upstream of the weir, while the other eight pools of the ladder will be located downstream of the weir beneath the Commercial Street Bridge. The weir crest will have a 2% slope (i.e., sloping down towards the center of the weir), but the crest will slope more steeply (12.5%) for approximately 9 ft on either side of the fish ladder in the center of the weir. This alignment will channel water towards the fish ladder, ensuring that the ladder conveys the majority of streamflow during low flow times of year. Approximately 27 ft downstream of the weir, two cut-off support walls will extend perpendicularly from the axis of fish ladder (parallel to the new weir). The void between the cut-off walls and the weir will be filled and regraded with material excavated from the site. At the downstream end of the fish ladder (approximately 45 ft downstream from the first set of cut-off walls), a second set of cut-off walls will extend parallel to the weir to support the fish ladder. The stream bank on both sides of the ladder will be graded to an elevation just below the top elevation of the cut-off walls. The cut-off walls will function as small grade control and upstream fish passage structures when flow exceeds the capacity of the fish ladder (Figure 2).

The staging area for construction will be located downstream of the Boise Cascade Building near the railroad trestle. Access to the construction site will be from the downstream side of the Boise Cascade Building, as well as from the upstream side of the Commercial Street Bridge. A small excavator will follow an existing gravel road from the downstream of the Boise Cascade Building to access the site from the staging area. Equipment will travel from the west along a temporary access road on the streambank under the Boise Cascade Building.

1.2.2 Construction Sequence

The USACE permit would require that construction occur within the preferred in-water work window (June 1, 2003 through Sept 30, 2003) established by the Oregon Department of Fish and Wildlife (ODFW). During Phase I of construction, the City will construct a cofferdam across the north half of the channel upstream of the existing weir, extending approximately 100 ft downstream to encompass the downstream end of the new ladder. Fish will be salvaged from the area inside the cofferdam prior to dewatering. All flow in Pringle Creek will be routed over the south half of the weir. The City will construct a notch, measuring approximately 4 ft wide and 18 in. deep, in the south half of the weir to facilitate upstream fish passage during construction on the south side of the weir. The City will also excavate a hole for a plunge pool downstream of the notch with a depth that is at least 1.5 times the height of the jump over the weir (as measured by the difference in water surface elevation at the notch). While the cofferdam is in place, the City will remove all rock-filled gabions, concrete pieces, and wire mesh remaining from the failed weir. Rounded river rock from any remaining gabions will be salvaged and used as on-site fill material, but the wire mesh will be hauled off-site for disposal. Any coarse, rough-edged rock will also be hauled off-site.

With the first cofferdam in place, the City will demolish and remove a large, abandoned concrete box vault located at the north end of the proposed new weir. This structure must be removed in order to adequately anchor the new weir. A concrete-cased waterline extends downstream from the existing box vault, and the City will remove several portions of this waterline before building the new weir.

The City must then excavate approximately 50-100 cubic yd of riverbed material prior to constructing the ladder, north cut-off walls, and new weir. Some of this material will be used as fill, and the remainder will be hauled off-site. After excavation is complete, the City will construct the new fish ladder, the north side of the weir, and the north cut-off walls. Since access to the site is limited, concrete will probably be pumped from a truck located above the creek on the Commercial Street Bridge. Prior to removal of the cofferdam, the streambed will be regraded to an elevation just below the top of the cut-off walls.

When the fish ladder, north half of the weir, and north cut-off walls are complete, the City will remove the cofferdam to allow completion of the south half of the weir and the south cut-off walls (Phase II of construction). With the fish ladder complete, all flow in Pringle Creek will be diverted into the fish ladder, with any excess water spilling over the north crest of the weir. Thus, the south half of the weir will become dewatered. The City will fill in the scour hole downstream of the existing weir with on-site material excavated during construction. The remainder of the material excavated from the site during construction will be disposed of off-site. The City will demolish and remove all rock-filled gabions, concrete pieces, and wire mesh remaining from the south half of the failed weir. It will then complete construction of the weir, construct the south cut-off walls, and regrade the streambed to just below the top elevation of the cut-off walls. Upon completion of the weir and south cut-off walls, the City will remove all construction equipment and temporary access roads and revegetate any disturbed areas where vegetation previously existed. The City will not revegetate areas underneath the Commercial Street Bridge and Boise Cascade Building, because there is not sufficient light in this area to sustain vegetation.

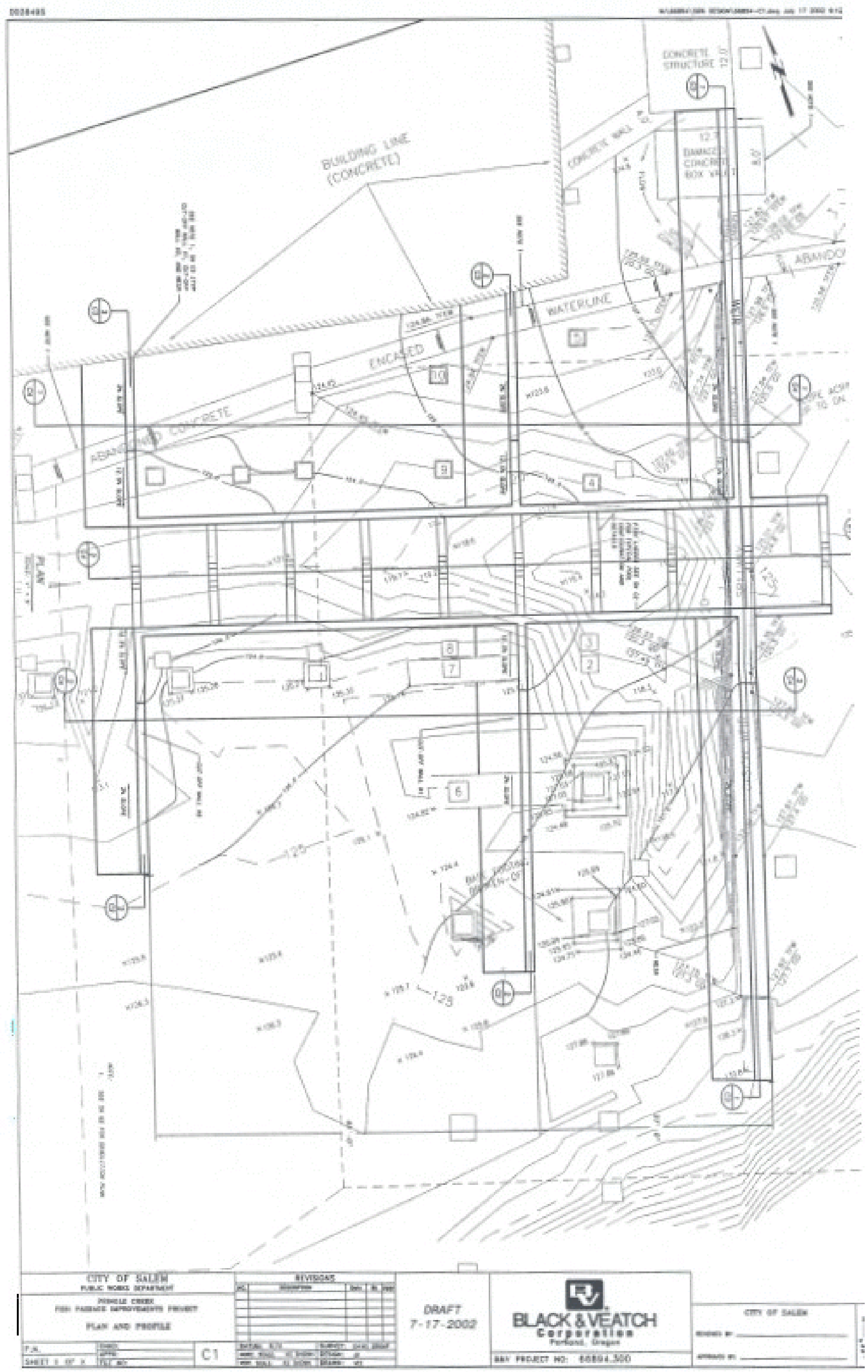


Figure 2. Design plans for the Pringle Creek Commercial Street weir and fish ladder.

1.2.3 Proposed Conservation Measures

The USACE permit would include the following conservation measures, proposed by the City, to minimize or avoid adverse impacts on listed species, habitat, and essential fish habitat (EFH). The City developed these conservation measures in collaboration with NOAA Fisheries, and the USACE submitted them to NOAA Fisheries as an addendum to the BA (thus amending the proposed action) on February 5, 2003. The City will incorporate these conservation measures into the contract document for the proposed project.

1.2.3.1 Fish Passage During Construction

During Phase I, the City will construct a fish passage notch in the south portion of the weir. The notch will be approximately 4 ft wide by 18 in. deep, and the plunge pool downstream of the notch will be excavated to a depth at least 1.5 times the height of the jump (measured as the difference in water surface elevations through the notch). The pool will be at least 4.5 ft deep.

1.2.3.2 Stream Flow During Construction

Stream flow in Pringle Creek and Shelton Ditch (to the extent to which they can be controlled through Shelton Ditch and the Mill Race) must remain adequate for adult fish passage through the project area during construction. Flows are anticipated to be approximately 10 to 20 cfs.

1.2.3.3 Stream Crossings

The City will allow the contractor two stream crossings each day (a round trip is two crossings). Primary access for crossings and construction will be from the south side of Pringle Creek. If more than two crossings per day are required for access to the north side of Pringle Creek, a temporary "bridge" crossing, possibly made from timber, I-beams, or similar materials, will be used to span ecology blocks placed in Pringle Creek. Another alternative for the stream crossing will be to install culverts that allow passage of water and fish. If the culvert alternative is selected, the City will contact NOAA Fisheries and ODFW to confer on details of the proposed crossing prior to installation.

1.2.3.4 Rock Removal from the Existing Gabions

In the event that quarry rock (rather than rounded river rock) is found in the existing gabions during their removal, the quarry rock will be removed from Pringle Creek and the floodplain. If the rock in the gabions consists of rounded river rock, it will be allowed to wash downstream.

1.2.3.5 Hydraulic/Design Monitoring

Upon completion of construction, the City's contractor will prepare an "as built" report of the construction. The "as built" report will compare the design elevations for the fish ladder and weir to the structure that was actually built. The contractor will evaluate hydraulic conditions in the fish ladder by measuring velocity and depth of flows that pass through the fish ladder under various flow scenarios (low flow to high flows).

1.2.3.6 Fish Ladder Maintenance Plan

The City will prepare a fish ladder maintenance plan within 90 days after completion of construction. The plan will detail the frequency of inspection and measures to be implemented if the fish ladder collects excessive amounts of debris, such as gravel and woody debris.

1.2.3.7 Monitoring and Reporting

To ensure that the fish ladder is operating correctly, the City will develop a monitoring strategy with NOAA Fisheries according to Reasonable and Prudent Measure (RPM) #13 (Monitoring) in the NMFS (2002) Programmatic Biological Opinion for Standard Local Operating Procedures for Endangered Species (SLOPES) for Certain Activities Requiring Department of the Army Permits in Oregon and the North Shore of the Columbia River. The strategy will incorporate the information compiled for the Hydraulic/Design Monitoring task discussed above.

1.2.3.8 Fish Salvage/Capture and Release

Fish salvage, as implemented by the City's contractor, will comply with the guidelines in RPM No. 2 (General Conditions for Construction and Operations and Maintenance) in NMFS (2002). Salvage methods will use acceptable fish screens on pumps to remove water from the isolation area. An experienced fish biologist (as defined by the guideline in NMFS 2002) will supervise all capture and release efforts.

1.2.3.9 Sediment/Erosion Control

The City will prepare and implement a Pollution and Erosion Control Plan (PECP) to prevent pollution of Pringle Creek related to construction operations. The plan will be available for inspection by the USACE or NOAA Fisheries upon request.

i. <u>Plan Contents</u>. The PECP will contain the pertinent elements listed below, and meet the requirements of all applicable laws and regulations.
   (1) Practices to prevent erosion and sedimentation associated with access roads, stream crossings, construction sites, borrow pit operations, haul roads, equipment and material storage sites, fueling operations and staging areas.

(2) Practices to confine, remove and dispose of excess concrete, cement, and other mortars or bonding agents, including measures for washout facilities.
(3) A description of any hazardous products or materials that will be used for the project, including procedures for inventory, storage, handling, and monitoring.
(4) A spill containment and control plan with notification procedures, specific clean-up and disposal instructions for different products, quick response containment and cleanup measures that will be available on the site, proposed methods for disposal of spilled materials, and employee training for spill containment.
(5) Practices to prevent construction debris from dropping into any stream or water body, and to remove any material that does drop with a minimum disturbance to the streambed and water quality.

ii. Inspection of Erosion Controls. During construction, all erosion controls will be inspected daily during the rainy season and weekly during the dry season to ensure they are working adequately.
(1) If inspection shows that the erosion controls are ineffective, work crews will be mobilized immediately to make repairs, install replacements, or install additional controls as necessary.
(2) Sediment will be removed from erosion controls once it has reached 1/3 of the exposed height of the control.

The approved plan will be implemented fully and monitored by the contractor. Construction activities that may contribute sediment or result in erosion will not begin before control devices are in place.

All control devices will be inspected daily during rainy periods and weekly during dry periods. During all phases of construction, including no-work periods and other work stoppages, personnel will be available to make immediate repairs on control devices. All silt fences will be removed upon completion of the project.

All equipment used for in-water work will be cleaned before use. External grease, oil, dirt, and mud will be removed. Water used for cleaning will not be discharged into the creek.

1.2.3.10 Hazardous Materials

The contractor will develop a Pollution Control Plan (including a spill response plan) and will be responsible for containment and removal of any hazardous material released including concrete. No hazardous material will be allowed to enter the river. The contractor will be responsible for containment and removal of any hazardous materials released.

In the event that hazardous material is encountered during the course of the work, regardless of whether or not the material was shown in the plans, implementation of the contractor's plan will be included in the scope of the contract and carried out by the contractor. The contractor will maintain, at the job site, the applicable equipment and material designated in the plan.

1.2.3.11 Additional Monitoring

Since the staging area is within 150 ft of the creek, the City will perform additional random inspections (once every 2 weeks) regarding implementation of the PECPs described in Conservation Measures 8.9 and 8.10. A third party, independent of the regular inspector and reporting directly to the City, will perform the inspections.

1.2.4 Description of the Action Area

An action area is defined by NOAA Fisheries regulations (50 CFR 402.02) as "all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action." Direct effects occur at the project site and may extend upstream or downstream based on the potential for impairing fish passage, hydraulics, sediment and pollutant discharge, and the extent of riparian habitat modifications. Indirect effects may occur throughout the watershed where actions described in this BO lead to additional activities or affect ecological functions, contributing to habitat degradation. Thus, the action area is defined as that bankline, riparian area, and aquatic habitat affected by the proposed action. For this consultation, the action area includes the bankline, riparian area, and aquatic habitat in Pringle Creek from approximately 100 ft upstream from the existing weir location at the Commercial Street Bridge, downstream to its confluence with the Willamette River.

1.3 Biological Information

Biological information on UWR chinook salmon may be found in the Status Review of Chinook Salmon from Washington, Oregon, and California (Myers et al. 1998). Biological information on UWR steelhead is available in Busby et al. (1996) and updated in Schiewe (1999). NOAA Fisheries expects that UWR chinook salmon and UWR steelhead may be present in the action area during construction. Both species are native to the Pringle Creek basin.

1.3.1 Upper Willamette River Chinook Salmon

1.3.1.1 Geographic Boundaries and Spatial Distribution

The UWR chinook salmon evolutionarily significant unit (ESU) includes native spring-run populations above Willamette Falls and in the Clackamas River. In the past, it included sizable numbers of spawning salmon in the Santiam River, the Middle Fork Willamette River, and the McKenzie River, as well as smaller numbers in the Molalla River, Calapooia River, and Albiqua Creek. Although the total number of fish returning to the Willamette has been relatively high (24,000), about 4,000 fish now spawn naturally in the ESU, of which about two-thirds originate in hatcheries. The McKenzie River probably supports the only remaining population in the ESU that is sustained by natural production (ODFW 1998a).

1.3.1.2 Historical Information

There are no direct estimates of the size of the chinook salmon runs in the Willamette River basin before the 1940s. McKernan and Mattson (1950) present anecdotal information that the Native American fishery at the Willamette Falls may have yielded 2,000,000 lb (908,000 kg) of salmon (454,000 fish, each weighing 20 lb [9.08 kg]). Based on egg collections at salmon hatcheries, Mattson (1948) estimates that the spring chinook salmon run in the 1920s may have been five times the run size of 55,000 fish in 1947, or 275,000 fish. Much of the early information on salmon runs in the upper Willamette River basin comes from the operation reports produced by state and Federal hatcheries.

1.3.1.3 Life History

Fish in this ESU are distinct from those of adjacent ESUs in life history and marine distribution (see Section 1.3.1.6). The timing of the spawning migration is limited by Willamette Falls. High flows in the spring allow access to the upper Willamette basin, whereas low flows in the summer and autumn prevent later-migrating fish from ascending the falls. The low flows have probably served as an isolating mechanism, separating this ESU from others nearby.

1.3.1.4 Habitat and Hydrology

Human activities have affected salmonid populations in the Willamette drainage. The Willamette River, once a highly braided river system, has been dramatically simplified through channelization, dredging, and other activities that have reduced rearing habitat (i.e., stream shoreline) by as much as 75%. In addition, the construction of 37 dams in the basin has blocked access to over 435 mi (700 km) of stream and river spawning habitat. The dams also alter the temperature regime of the Willamette and its tributaries, affecting the timing of development of naturally spawned eggs and fry. Development and other economic activities also affect water quality. Agricultural and urban land uses on the valley floor, as well as timber harvesting in the Cascade and Coast ranges, contribute to increased erosion and sediment load in Willamette basin streams and rivers. Finally, since at least the 1920s, water quality in the lower Willamette has been affected by runoff and discharge from municipal and industrial development.

1.3.1.5 Hatchery Influence

Hatchery production in the basin began in the late nineteenth century. Eggs were transported throughout the basin, resulting in current populations that are relatively homogeneous genetically (although still distinct from those of surrounding ESUs). Hatchery production continues in the Willamette, with an average of 8.4 million smolts and fingerlings released each year into the main river or its tributaries between 1975 and 1994. Hatcheries are currently responsible for most production in the basin.

The Clackamas River currently accounts for about 20% of the production potential in the Willamette River basin, originating from one hatchery plus natural production areas that are primarily located above the North Fork Dam. The interim escapement goal for the area above North Fork Dam is 2,900 fish (ODFW 1998b). However, the system is heavily influenced by hatchery production and, until recently, it has been difficult to distinguish spawners of natural origin from hatchery fish. Approximately 1,000 to 1,500 adults have been counted at the North Fork Dam in recent years.

1.3.1.6 Harvest

Spring chinook salmon returning to the Willamette basin are caught in ocean and freshwater fisheries, primarily in southeast Alaska and north central British Columbia. In the past, spring chinook were subject to high cumulative harvest rates; the ocean fishery impact rate averaged 22% for the 1975 through 1983 brood years, 14% for 1984 through 1989 brood years, and 9% for 1990 through 1993. Future ocean harvest rates are likely to be in the range of 10% to 20% under the recently completed amendments to the Pacific Salmon Treaty. In freshwater fisheries (the mainstem Columbia and Willamette rivers) the average harvest rate was approximately 36% during 1970 to 2001. Under ODFW's new Fisheries Management and Evaluation Plan, approved by NOAA Fisheries in 2001, anglers must release all unmarked spring chinook; only fin-clipped fish can be retained. The fisheries are managed so as not to exceed a handling mortality rate of 15%, and an average fishery rate of 10% to 11% (ODFW 2001).

1.3.1.7 Population Trends and Risks

For the UWR chinook salmon ESU as a whole, NOAA Fisheries estimates that the median population growth rate (lambda) over the base period[1] ranges from 1.01 to 0.63, decreasing as the effectiveness of hatchery fish spawning in the wild increases compared to that of fish of wild origin (Tables B-2a and B-2b in McClure et al. 2000). NOAA-Fisheries has also estimated the risk of absolute extinction for the aggregate UWR chinook salmon population in the McKenzie River, above Leaburg (the only self-sustaining population in the ESU), using the same range of assumptions about the relative effectiveness of hatchery fish. At the low end, assuming that hatchery fish spawning in the wild have not produced adult returns (i.e., hatchery effectiveness = 0), the risk of absolute extinction within 100 years is 0.01 (Table B-5 in McClure et al. 2000). At the high end, assuming that the hatchery fish spawning in the wild have been as productive as wild-origin fish (hatchery effectiveness = 100%), the risk of absolute extinction within 100 years

[1] Estimates of median population growth rate, risk of extinction, and the likelihood of meeting recovery goals are based on population trends observed during a base period beginning in 1980 and including 1998 adult returns. Population trends are projected under the assumption that all conditions will stay the same into the future.

is 0.85 (Table B-6 in McClure et al. 2000).

1.3.2 Upper Willamette River Steelhead

1.3.2.1 Geographic Boundaries and Spatial Distribution

The UWR steelhead ESU occupies the Willamette River and tributaries upstream of Willamette Falls, extending to and including the Calapooia River. These major river basins containing spawning and rearing habitat comprise more than 4,600 mi^2 (12,000 km^2). Rivers that contain naturally spawning winter-run steelhead include the Tualatin, Molalla, Santiam, Calapooia, Yamhill, Rickreall, Luckiamute, and Marys. Early migrating winter and summer steelhead have been introduced into the upper Willamette basin, but those runs are not part of the UWR steelhead ESU.

1.3.2.2 Historical Information

Native winter steelhead within this ESU have been declining since 1971 and have exhibited large fluctuations in abundance.

1.3.2.3 Life History

Native steelhead of the upper Willamette River basin are late winter-run, entering freshwater primarily in March and April. Run timing appears to be an adaptation for ascending Willamette Falls. Reproductive isolation resulting from the falls may explain the genetic distinction between steelhead from the upper Willamette River basin and those in the lower Columbia River. UWR late-migrating steelhead are ocean-maturing fish. Most return at age 4, with a small proportion returning as 5-year-olds (Busby et al. 1996).

1.3.2.4 Habitat and Hydrology

Effects on habitat and hydrology are similar to those described above for UWR chinook salmon. Effects on temperature regime below the dams differ because winter steelhead redds incubate during spring and early summer, when water temperatures are colder than during the predevelopment period (i.e., emergence may be delayed).

1.3.2.5 Hatchery Influence

The main hatchery production of native (late-run) winter steelhead occured in the North Fork Santiam River, where estimates of hatchery proportion in natural spawning areas ranged from 14% to 54% (Busby et al. 1996). More recent estimates of the percentage of naturally spawning fish attributable to hatcheries in the late 1990s were 24% in the Molalla, 17% in the North Santiam, 5% to 12% in the South Santiam, and less than 5% in the Calapooia (Chilcote 1997, 1998). ODFW discontinued the release of the late-winter run in 1998 due to concerns over the potential effects of residualized steelhead on the native population, interbreeding, genetic interactions with the native population, and the cost effectiveness of the program (Mamoyac 2003).

1.3.2.6 Harvest

Winter steelhead are caught primarily in freshwater, rarely in ocean fisheries. Prior to 1992, wild steelhead could be harvested in the Willamette basin and its tributaries at an estimated rate of 21% (ODFW 2001). In response to poor returns above Willamette Falls, ODFW implemented regulations prohibiting the retention of wild steelhead. Fishery impact rates then decreased to an estimated 2%. Although catch and release fisheries still occur in the Willamette River and its tributaries, angler participation in the fishery decreased once the Willamette basin hatchery program for winter steelhead was discontinued. Overall fishery impacts are now approximately 1%.

1.3.2.7 Population Trends and Risks

For the UWR steelhead ESU as a whole, NOAA Fisheries estimates that the median population growth rate (lambda) over the base period[2] ranges from 0.94 to 0.87, decreasing as the effectiveness of hatchery fish spawning in the wild increases, compared to that of fish of wild origin (Tables B-2a and B-2b in McClure et al. 2000). NOAA Fisheries has also estimated the risk of absolute extinction for four spawning aggregations using the same range of assumptions about the relative effectiveness of hatchery fish. At the low end, assuming that hatchery fish spawning in the wild have not produced adult returns (i.e., hatchery effectiveness = 0), the risk of absolute extinction within 100 years ranges from zero for the South Santiam River to 0.74 for the Calapooia River (Table B-5 in McClure et al. 2000). Assuming that the hatchery fish spawning in the wild have been as productive as wild-origin fish (hatchery effectiveness = 100%), the risk of absolute extinction within 100 years ranges from 0.74 for the Calapooia River to 1.00 for the Molalla River and South Santiam River spawning aggregations (Table B-6 in McClure et al. 2000).

1.3.3 UWR Chinook Salmon and Steelhead in Pringle Creek

Although both UWR chinook salmon and steelhead are native to the Pringle Creek basin, no quantitative information is available regarding use of Pringle Creek by either of these species. However, water originating from the North Santiam River enters Pringle Creek via both the Mill Race and Shelton Ditch. It is likely that juveniles outmigrating form the North Santiam River

[2] Estimates of median population growth rate, risk of extinction, and the likelihood of meeting recovery goals are based on population trends observed during a base period beginning in 1980 and including 1997 adult returns. Population trends are projected under the assumption that all conditions will stay the same into the future.

use these two artificial channels as outmigration routes, passing through Pringle Creek prior to entering the Willamette River (Hunt 2002). Juvenile salmon and steelhead may use Pringle Creek for rearing; however, rearing in the immediate vicinity of the project area is limited by high water velocities underneath the Boise Cascade Building.

Adult UWR chinook salmon and steelhead detecting the scent of the North Santiam water at the mouth of Pringle Creek, migrate up Pringle Creek, through the Shelton Ditch, then continue to their spawning grounds in the North Santiam River. Individuals of both species could become confused and experience delay at the mouth of Pringle Creek, where they detect the scent of the North Santiam River in both Pringle Creek and the Willamette River. UWR steelhead may spawn in Pringle Creek, but it is likely that most steelhead seen in Pringle Creek are passing upstream to the North Santiam River (Hunt 2002).

1.4 Evaluating Proposed Actions

The standards for determining jeopardy are set forth in Section 7(a)(2) of the ESA as defined by 50 CFR Part 402.02 (the consultation regulations). In conducting analyses of habitat-altering actions under Section 7 of the ESA, NOAA Fisheries uses the following steps of the consultation regulations: (1) consider the status and biological requirements of the species; (2) evaluate the relevance of the environmental baseline in the action area to the species' current status; (3) determine the effects of the proposed or continuing action on the species, and whether the action is consistent with the available recovery strategy; (4) consider cumulative effects; and (5) determine whether the species can be expected to survive with an adequate potential for recovery under the effects of the proposed or continuing action, the effects of the environmental baseline, and any cumulative effects, and considering measures for survival and recovery specific to other life stages. If NOAA Fisheries determines that the proposed action is likely to jeopardize, it will identify reasonable and prudent alternatives for the action that avoid jeopardy.

The first step NOAA Fisheries uses when applying the ESA Section 7(a)(2) to the listed ESUs considered in this BO is to define the species' biological requirements. Since 1995, NOAA Fisheries has developed the viable salmonid population (VSP) concept as a tool to evaluate whether the population-level biological requirements of ESUs are met (McElhany et al. 2000). VSPs are independent populations that have a negligible risk of extinction due to threats from demographic variation (random or directional), local environmental variation, and genetic diversity changes (random or directional) over 100 years. The attributes associated with VSPs include adequate abundance, productivity (population growth rate), juvenile outmigrant production, population spatial scale, and diversity. Biological requirements are met when the independent, naturally-reproducing populations that make up a listed ESU are large and numerous enough to safeguard the genetic diversity of the ESU, enhance its capacity to adapt to various environmental conditions, and allow it to become self-sustaining in the natural environment. At this point, protection under the ESA will become unnecessary. Biological requirements may also be described as the habitat conditions necessary to ensure the species' continued existence (i.e., functional habitats) and these can be expressed in terms of physical, chemical, and biological parameters. The manner in which these requirements are described, as population variables or as habitat parameters, varies according to the nature of the action under consultation and its likely effects on the species.

Whether species' biological requirements are expressed as population or habitat parameters, there is a strong causal link between the two: actions that affect habitat have the potential to affect population abundance, productivity, and diversity. By examining the effects of a given action on the habitat portion of a species' biological requirements, NOAA Fisheries can gauge how that action will affect the population parameters that constitute a species' biological requirements and, ultimately, how the action will affect the species' current and future health.

Ideally, reliable scientific information on a species' biological requirements would exist at both the population and the ESU levels, and effects on habitat should be readily quantifiable in terms of population-level impacts. In the absence of such information, NOAA Fisheries' analyses must rely on generally applicable scientific research that one may reasonably extrapolate to the action area and to the population(s) in question. For actions that affect freshwater habitat, NOAA Fisheries usually defines the biological requirements in terms of a concept called properly functioning condition (PFC). PFC is the sustained presence of natural[3] habitat forming processes in a watershed (e.g., riparian community succession, bedload transport, precipitation runoff pattern, and channel migration) that are necessary for the long-term survival of the species through the full range of environmental variation. PFC constitutes the habitat component of a species' biological requirements. The indicators of PFC vary between different landscapes based on unique physiographic and geologic features. For example, aquatic habitats on timberlands in glacial mountain valleys are controlled by natural processes operating at different scales and rates than are habitats on low-elevation coastal rivers.

In the PFC framework, baseline environmental conditions are described as "properly functioning," "at risk," or "not properly functioning." If a proposed action would be likely to impair[4] properly functioning habitat, appreciably reduce the functioning of already impaired habitat, or retard the long-term progress of impaired habitat toward PFC, it will usually be found likely to jeopardize the continued existence of the species (or adversely modify its critical habitat or both, depending upon the specific considerations of the analysis). Such considerations may include, for example, the species' status, the condition of the environmental baseline, the particular reasons for listing the species, any new threats that have arisen since listing, and the

[3] The word "natural" in this definition is not intended to imply "pristine," nor does the best available science lead NOAA Fisheries to believe that only pristine wilderness will support salmon.

[4] In this document, to "impair" habitat means to reduce habitat condition to the extent that it does not fully support long-term salmon survival. Therefore, "impaired habitat" is that which does not perform that full support function. Note that "impair" and "impaired" are not intended to signify any and all reduction in habitat condition.

quality of the available information.

NOAA Fisheries typically considers the status of habitat variables in a matrix of pathways and indicators (MPI; see Table 1 in NMFS [1996]), which was developed to describe PFC in forested montane watersheds. Baseline environmental conditions are described as "properly functioning," "at risk," or "not properly functioning," in accordance with the PFC framework. NOAA Fisheries relies on these pathways and indicators because they are supported in the scientific literature as being affected by land management activities, and are relevant to the survival and recovery of the freshwater life stages of Pacific salmon.

1.4.1 Environmental Baseline

The environmental baseline is defined as "the past and present impacts of all Federal, state, or private actions and other human activities in the action area, including the anticipated impacts of all proposed Federal projects in the action area that have undergone Section 7 and the impacts of state and private action that are contemporaneous with the consultation in progress" (50 CFR 402.02). In step 2, NOAA Fisheries evaluates the relevance of the environmental baseline in the action area to the species.

1.4.1.1 Pringle Creek Watershed

The Pringle Creek basin includes over 10 mi of waterways, and is the primary basin flowing through downtown Salem, Oregon (City of Salem 2001). Land use in the Pringle Creek watershed is predominately urban, commercial, and industrial, while some rural and residential uses exist in portions of the upper watershed. Habitat conditions in the upper watershed are generally more affected by human activity than in the lower reaches. The majority of the riparian area in the upper watershed has been replaced by non-native vegetation, rip-rap, and concrete, and the stream has been channelized in many locations. In recent years, local community groups, including schools and the Pringle Creek Watershed Council, have conducted small-scale riparian vegetation restoration projects, but riparian vegetation condition remains degraded throughout the watershed. Development frequently exists in the riparian zone immediately adjacent to the creek. Substrate in the upper watershed is predominantly silt, with some areas having hard, clay-like substrate. Large wood is lacking throughout the Pringle Creek basin, and recruitment potential is low, due the limited number of trees in the riparian zone serving as source material. The stream appears to be incised, with limited channel complexity, floodplain connectivity, and off-channel habitat.

Pringle Creek is fed by five tributaries within its 15-mi^2 watershed, but also receives water from a complicated system of diversion canals (Figure 1). The City of Salem diverts approximately 80-100 cfs into the Salem Ditch on the North Santiam River. The Salem Ditch traverses approximately 2 mi of land prior to emptying into Mill Creek, a watershed which enters the Willamette River approximately 1 mi north of the mouth of Pringle Creek. Up to 100 cfs is diverted from Mill Creek into the Salem Mill Race to provide water for a historic mill. After flowing through the City of Salem, the Willamette University campus, and Mission Mill, the Mill Race enters Pringle Creek from the north bank, approximately 50 yd upstream from the weir. Pringle Creek is also fed by Shelton Ditch, which is diverted from Mill Creek upstream of the Mill Race diversion. The City diverts flow from Mill Creek into Shelton Ditch, which then empties into Pringle Creek. Thus, natural flow in Pringle Creek is augmented with flow originating from the North Santiam River via Shelton Ditch, and the Mill Race. Natural flow in Pringle Creek during the summer months is minimal, less than 10 cfs by late summer. However, because the basin is highly developed, it experiences high, flashy flows in the winter months. Additionally, during winter storm events, a sanitary sewer overflow empties into Pringle Creek.

Numerous barriers, in addition to the existing Commercial Street Bridge weir, block or delay fish passage within the Pringle Creek watershed. Several weirs, dams, and culverts are suspected to limit upstream migration of fish. A 2001 passage survey within Pringle Creek identified 21 culverts, 11 bridges, and 14 dams. The City determined that 10 culverts and 9 dams or weirs could be barriers (City of Salem 2001).

1.4.1.2 Physical Habitat within the Action Area

The existing weir is located approximately 900 ft upstream from the mouth of Pringle Creek. From the weir downstream, Pringle Creek flows underneath the Commercial Street Bridge and the Boise Cascade Building for approximately 300 ft. The slope of the stream in this reach averages approximately 1.5%, with a maximum of 9.4%. Areas of localized high-velocity flow exist as the stream winds around the bridge, building, and train trestle pilings. The stream in this reach is laterally confined by steep banks and the walls of the Boise Cascade Building, and in high-flow events, the creek spans the width of the channel and is several feet deep. Due to scour during high flow events, and lack of light underneath the bridge and building, there is no riparian vegetation in this 300-ft reach.

Until the recent failure in July 2002, the Commercial Street Bridge weir was functioning as it was intended by facilitating gravel deposition in the reach immediately upstream of the weir. This reach contains suitable spawning gravel and adequate cover for chinook salmon and resident fish. Approximately 600 ft upstream of the weir, the City constructed a viewing platform so residents can view spawning chinook salmon.

The highest quality habitat in the Pringle Creek basin is the area within the 300 ft of confluence of Pringle Creek with the Willamette River. This reach contains riparian cover, although some of vegetation consists of non-native species. The reach contains riffle and run habitat, with adequate spawning gravel supply, which may be used by mainstem-spawning salmon and steelhead (City of Salem 2001).

1.4.1.3 Water Quality

Despite augmentation with flow from the North Santiam River, water quality in Pringle Creek is degraded. Pringle Creek is listed on the Oregon Department of Environmental Quality's 303(d) List of Water Quality Limited Bodies for temperature, toxics (dieldrin), lead, copper, and zinc (ODEQ 2002). Additionally, a recent report published by the U.S. Geological Survey (Tanner 1999) reported high concentrations of DDD, DDE, and DDT in sediment samples from the east fork of Pringle Creek.

Pollutants can be introduced into waterbodies through direct contact with contaminated surfaces or by the introduction of storm or washwater runoff and can remain in solution in the water column or deposit on the existing bed material. Research has shown that exposure to contaminants reduces reproductive capacity, growth rates, and resistance to disease, and may lead to lower survival for salmon (Arkoosh 1998 a, b).

Due to the extent of human disturbance in the Pringle Creek watershed, turbidity levels in the action area, located near the mouth of the stream, could be elevated compared to an undisturbed basin of comparable size. The effects of suspended sediment and turbidity on fish are reported in the literature as ranging from beneficial to detrimental (see below). Elevated total suspended solids (TSS) conditions have been reported to enhance cover conditions, reduce piscivorous fish/bird predation rates, and improve survival. Elevated TSS conditions have also been reported to cause physiological stress, reduce growth, and adversely affect survival. Of key importance in considering the detrimental effects of TSS on fish are the season, frequency, and duration of the exposure (not just the TSS concentration).

Behavioral avoidance of turbid waters may be one of the most important effects of suspended sediments (DeVore et al. 1980; Birtwell et al. 1984; Scannell 1988). Salmonids have been observed to move laterally and downstream to avoid turbid plumes (McLeay et al. 1984; Sigler et al. 1984; Lloyd 1987; Scannell 1988; Servizi and Martens 1991). Juvenile salmonids tend to avoid streams that are chronically turbid, such as glacial streams or those disturbed by human activities, except when the fish need to traverse these streams along migration routes (Lloyd et al. 1987). Gregory and Levings (1998) reported that turbidity also provides refuge and cover from piscivorous fish and birds. In systems with intense predation pressure, this benefit (i.e., enhanced survival) may balance the cost of detrimental physical effects (i.e., reduced growth). Turbidity levels of about 23 Nephalometric Turbidity Units (NTU) have been found to minimize predation risk (Gregory 1993).

Exposure duration is a critical determinant of the occurrence and magnitude of physical or behavioral effects (Newcombe and MacDonald 1991). Salmonids have evolved in systems that periodically experience short-term pulses (days to weeks) of high suspended sediment loads, often associated with flood events, and are adapted to such high pulse exposures. Adult and larger juvenile salmonids appear to be little affected by the high concentrations of suspended sediments that occur during storm and snowmelt runoff episodes (Bjornn and Reiser 1991). However, research indicates that chronic exposure can cause physiological stress responses that can increase maintenance energy and reduce feeding and growth (Lloyd 1987; Redding et al. 1987; Servizi and Martens 1991).

At moderate levels, turbidity has the potential to adversely affect primary and secondary productivity, and at high levels, has the potential to injure and kill adult and juvenile fish. Turbidity might also interfere with feeding (Spence et al. 1996). Newly emerged salmonid fry may be vulnerable to even moderate amounts of turbidity (Bjornn and Reiser 1991). Other behavioral effects on fish, such as gill flaring and feeding changes, have been observed in response to pulses of suspended sediment (Berg and Northcote 1985). Fine redeposited sediments also have the potential to adversely affect primary and secondary productivity (Spence et al. 1996), and to reduce incubation success (Bell 1991) and cover for juvenile salmonids (Bjornn and Reiser 1991). Larger juvenile and adult salmon appear to be little affected by ephemeral high concentrations of suspended sediments that occur during most storms and episodes of snow melt. However, other research demonstrates that feeding and territorial behavior can be disrupted by short-term exposure to turbid water.

1.4.1.4 Status of the Baseline

Table 1 summarizes the factors relevant to the status of the environmental baseline in the action area, based on the *Matrix of Pathways and Indicators* (MPI) described in NMFS (1996).

Table 1. Status of the environmental baseline within the action area, as defined by NOAA Fisheries' Matrix of Pathways and Indicators (NMFS 1996, 1999). Many of these baseline conditions were determined by visual observation during a site visit to the action area on May 1, 2002.

PFC Pathway	PFC Indicator	Properly Functioning Conditions	Current Baseline Conditions in the Action Area	Status
Water Quality	Temperature	ODEQ criterion: Rearing- 17.8ºC	The reach of Pringle Creek in the action area is listed on the ODEQ's 303 (d) list for violations of the summer rearing temperature criterion.	NPF
	Sediment/Turbidity	< 12% fines in gravel, low turbidity	Turbidity is slightly elevated in the action area, particularly during storm events.	At risk
	Chemical/nutrient Contamination	Low levels of chemical contamination from agricultural, industrial, and other sources; no excess nutrients; no CWA 303(d) designated reaches	The reach of Pringle Creek within the action area is on the ODEQ's 303 (d) list for exceedence of the following anadromous fish passage and resident/aquatic life criteria: (1) Toxics/Pesticides (Dieldrin): > .0019 ug/L (2) Copper: > hardness dependent criterion (3) Lead: >hardness dependent criterion (4) Zinc: > hardness dependent criterion	NPF
Habitat Access	Physical barriers	Any man-made barriers present in the watershed allow upstream and downstream passage at all flows	The Commercial Street bridge weir, located near the mouth of Pringle Creek, was classified as a passage barrier in a 2001 survey (City of Salem).	NPF

Habitat Elements	Substrate	Dominant substrate is gravel or cobble (interstitial spaces clear) or embeddedness <20%	Substrate in the action area consists of gravel, cobble, and boulders, some of which are compacted and embedded. High water velocities in the action area prevent additional deposition of fine sediment.	At risk
	Large wood	>80 pieces per mile and adequate source of large wood recruitment	Large wood is lacking within the action area, and a loss of riparian vegetation throughout the developed watershed indicates a low likelihood for recruitment of large wood.	NPF
	Pool Frequency		Very few pools exist within the action area. Most of the reach consists of high velocity habitat with few resting places.	NPF
	Pool quality	>1m deep	Very few pools within the action area are deeper than 1.3 m at base flow, with the exception of the pool formed upstream of the Commercial Street weir.	At risk
	Off-channel habitat	Backwaters with cover, and low-energy off-channel areas	Due to channel confinement, no backwater or low-energy off channel habitat exist in the action area reach of Pringle Creek.	NPF
	Refugia	Habitat refugia exist and are adequately buffered; existing refugia are sufficient in size, number, and connectivity to maintain viable populations or subpopulations	Some refugia exist in the action area reach (i.e., between the Boise Cascade Building and the mouth of Pringle Creek), but they are neither large nor high-quality.	At risk
Channel Conditions and Dynamics	Width/Depth ratio	<10	There are no width/depth data available within the action area.	Unknown
	Streambank condition	>90% stable due to presence of riparian vegetation, erosion and deposition processes are in a state of dynamic equilibrium.	Streambanks within the action area are stable, with the exception of an area 100 feet upstream of the weir. Because the majority of the streambanks in the action area are bounded by concrete/hardened structures (bridge abutments, building walls, or rip-rap), these banks are not in a state of dynamic equilibrium. Many are not capable of supporting riparian vegetation due to lack of light.	NPF
	Floodplain Connectivity	Off-channel areas are frequently hydrologically linked to main channel; overbank flows occur and maintain wetland function, riparian vegetation, and succession.	No off-channel habitat exists within the action area. The stream is incised, channelized, and lacking in native riparian vegetation.	NPF
Flow/ hydrology	Change in Peak/Base flows	Watershed hydrograph indicates peak flow, base flow, and flow timing characteristics comparable to an undisturbed watershed of similar size, geology, and geography	Pringle Creek is augmented with flow from the North Santiam River, so base flows are artificially elevated. The stream is highly urbanized, and the reach of Pringle Creek within the action area experiences rapid fluctuations in stream flow during storm events. Thus, the storm hydrograph for Pringle Creek is much more flashy than an undisturbed stream of similar size.	At risk

Watershed Conditions	Road Density and Location	<2 mi/mi^2, no valley bottom roads	Almost the entire Pringle Creek watershed, including the action area, is dominated by residential or urban land use, so road density is very high. The dense road network in the basin has contributed to a decline in proper infiltration of precipitation, which has contributed to declining floodplain and hydrological function within the action area.	NPF
	Disturbance history	Land-clearing and development activities have not significantly altered hydrologic and natural contaminant filtration processes (e.g. infiltration, run-off rates, etc.)	Approximately 19% of the Pringle Creek Basin is impervious surface and an additional 20% is disturbed land (City of Salem 2002). The action area is surrounded by impervious surfaces and disturbed areas, which has contributed to declining floodplain and hydrological function in the action area.	NPF
	Riparian Reserves	The riparian reserve system provides adequate shade, large wood recruitment, and habitat protection and connectivity in all watershed	Only 19% of the Pringle Creek watershed is vegetated with trees. Riparian cover is lacking throughout the watershed, including within the action area. Much of the existing riparian vegetation consists of non-native vegetation.	NPF

Based on the information above, many of the habitat and biological requirement of UWR chinook salmon and steelhead in the action area are not being met under the environmental baseline. Any further degradation or delay in improving these conditions might increase the amount of risk that the listed ESUs presently face. The status of these species are such that there must be a significant improvement in the biological and habitat conditions they have experienced under the environmental baseline to meet their biological requirements for survival and recovery.

1.5 Effects of the Proposed Action

In step 3 of the jeopardy analysis, NOAA Fisheries evaluates the effects of proposed actions on listed species and seeks to answer the question of whether the species can be expected to survive with an adequate potential for recovery if those actions go forward. There is more than one analytical framework for determining an activity's effect, and NOAA Fisheries will consider any scientifically credible analysis. In order to streamline the consultation process and to lead to more consistent effects determinations across agencies, NOAA Fisheries recommends use of the MPI and procedures in NMFS (1996) to make effects' determinations. Regardless of the analytical method used, if a proposed action is likely to impair properly functioning habitat, appreciably reduce the functioning of already impaired habitat, or retard the long-term progress of impaired habitat toward PFC, it cannot be found consistent with conserving the species.

The BA for the Pringle Creek Commercial Street Bridge Weir and Fish Ladder (USACE 2002) provides an analysis of the effects of the proposed action on UWR chinook salmon and steelhead and their habitat in the action area. The analysis uses the MPI and procedures in NMFS (1996) and the information in the BA to evaluate elements of the proposed action that have the potential to affect the listed fish or their habitat.

Potential impacts to listed salmonids from the proposed action include both direct and indirect effects. Potential indirect effects include behavioral changes resulting from elevated turbidity levels and in-water work (Sigler et al. 1984; Berg and Northcote 1985) during construction activities. Potential direct effects include mortality from exposure to suspended sediment or toxic chemicals, capture and handling, and in-water work.

1.5.1 Water Quality

In-water work required to construct and access the cofferdam will probably temporarily elevate levels of turbidity and suspended sediment in the action area. Due to the limited duration and frequency of in-water construction, and because fine sediments are not likely to settle in spawning areas, any downstream accumulations of fine sediment are expected to have only short-term effects on bed material composition. In-river work will require machinery to operate directly in, and in close proximity to, the stream, introducing a chance for toxic contaminants to enter the river. As discussed in Section 1.4.2.3, exposure to toxic chemicals or elevated turbidity levels can adversely affect aquatic life.

The City's proposed conservation measures include numerous measures for reducing the likelihood that suspended sediment or pollutants will enter the river. Implementation of a PECP is included in the proposed action as the City's Conservation Measures 8.9 and 8.10 (see Sections 1.2.3.9 and 1.2.3.10). The likelihood that contaminants will enter waterways will be minimized by implementation and enforcement of the PECP. The City acknowledges that additional risks are introduced by siting the construction staging area within 150 ft of the stream. Therefore, the City will perform supplemental, random construction site inspections (by a third-party inspector) to ensure strict compliance with the PECPs.

To reduce the likelihood of suspended sediment and chemical pollutants entering the stream during in-water work, the City will install a temporary bridge across Pringle Creek if the stream must be crossed more than twice in one day. As described in the City's Proposed Conservation Measure 8.3 (Section 1.2.3.3), the crossing will consist of either a small bridge spanning ecology blocks or a culvert passing through a small push-up dam. If the latter is the method preferred by the contractor, the City will notify NOAA Fisheries to provide details necessary to ensure safe fish passage through the crossing.

1.5.2 Direct Harm Due to In-water Work and Dewatering

Direct harm could be inflicted on listed salmonids during the capture and release of fish behind the cofferdam prior to dewatering. As described in Proposed Conservation Measure 8.3 (Section 1.2.3.8), the City proposes to comply with NOAA Fisheries' guidelines for safe fish salvage/capture and release practices as described in NMFS (2002). By following these guidelines, the City should minimize the likelihood of lethal take associated with fish capture and release. Additional direct harm is possible during in-water work, although it is likely that fish will vacate the immediate area when equipment enters the water. As mentioned, the City will construct a temporary bridge crossing if the contractor must cross the stream more than twice a day. This will reduce the likelihood of direct harm associated with in-water work.

1.5.3 Long-Term Effects

For the past 6 years, the Commercial Street Bridge weir has been a barrier to fish migration within Pringle Creek. Reconstruction of the Commercial Street Bridge weir and fish ladder will substantially improve passage conditions on Pringle Creek, and will probably contribute to formation of habitat beneficial to listed salmon. Upon completion of construction, the City will provide verification to NOAA Fisheries that the ladder was constructed as designed. As described in Proposed Conservation Measure 8.6 (Section 1.2.3.6) the City will submit a maintenance plan to NOAA Fisheries within 90 days after completion of construction. This plan will describe the City's long-term efforts to maintain the new fish ladder in working condition to ensure safe passage of fish. Additionally, the City will develop a monitoring strategy in collaboration with NOAA Fisheries, and in accordance with the criteria described in Term and Condition 13 in NMFS (2002).

1.5.4 Summary of Project Effects

Table 2 describes the expected type and duration of effects of the proposed action on the environmental baseline. A pulse effect is one which will have temporary effects that will be relaxed almost immediately upon cessation of construction, while press effects will persist for at least several years before relaxing.

Table 2. Summary of effects of the proposed action on UWR chinook salmon and steelhead and the environmental baseline.

PFC Pathway	PFC Indicator	Baseline Condition	Proposed Action Affecting Baseline Condition	Type and Duration of Effect	Probability of effect occurring	Effects on Baseline
Water Quality	Temperature	NPF	The proposed action is not expected to affect water temperature.	none		Maintain
	Sediment/ Turbidity	At Risk	In-water work necessary to excavate, construct and access the cofferdam will likely increase turbidity and suspended sediment within the action area.	Pulse- effect will likely cease upon construction. Any sediment that settled downstream of the project will be flushed out in the first storm event.	likely	Maintain
	Chemical Nutrient Contamination	NPF	Chemical pollutants from construction equipment could leak into the creek during in-water work or from the staging area. Implementation of the PECP and supplemental inspections will minimize the likelihood of this occurring.	Pulse- implementation of erosion control and spill containment measures will minimize the duration and intensity of this effect.	unlikely, but possible	Maintain
Habitat Access	Physical Barriers	NPF	Passage through the project area will be maintained throughout construction. The new fish ladder will enhance long term fish passage conditions in within the action area.	Long-term	almost certain	Improve over long term
Habitat Elements	Substrate	At risk	Excavation and regrading will redistribute substrate within the action area. Deconstruction of the gabion weir will likely introduce new gravel and cobble into the lower reach of Pringle Creek. Additionally, the new weir will facilitate retention of gravel within the action area.	Press- the increase in available gravel and cobble will be likely persist for several years until it is transported downstream to the mouth of Pringle Creek.	almost certain	Improve over short term
	Large Wood	NPF	The proposed action is not expected to affect large wood within the action area.	N/A	N/A	Maintain
	Pool Frequency	NPF	Although the new fish ladder will contain several resting pools, the proposed action is not likely to affect the frequency of natural pools within the action area.	N/A	N/A	Maintain
	Pool quality	At risk	Although the new fish ladder will contain several resting pools, the proposed action is not expected to affect the quality of natural pools within the action area.	N/A	N/A	Maintain

	Off-channel habitat	NPF	The proposed action is not expected to affect off-channel habitat within the action area.	N/A	N/A	Maintain
	Refugia	At risk	The proposed action is not expected to affect refugia within the action area.	N/A	N/A	Maintain
Channel Condition and Dynamics	Width/ Depth Ratio	Unknown	The new fish ladder will confine flow for approximately 80 feet within the fish ladder, temporarily creating a narrow channel. However, the proposed action is not expected to affect width/depth ratio within the natural channel of Pringle Creek.	N/A	N/A	Maintain
	Streambank condition	At risk	The proposed action is not expected to change streambank condition within the action area.	N/A	N/A	Maintain
	Floodplain connectivity	NPF	The proposed action is not expected to change floodplain connectivity within the action area.	N/A	N/A	Maintain
Flow/ Hydrology	Change in Peak/Base flows	At risk	The proposed action is not expected to change peak or base flows within the action area.	N/A	N/A	Maintain
Watershed Conditions	Road Density and Location	NPF	The proposed action is not expected to change road density and location within the action area.	N/A	N/A	Maintain
	Disturbance History	NPF	The proposed action is not expected to change disturbance history within the action area.	N/A	N/A	Maintain
	Riparian Reserves	NPF	The proposed action occurs mostly within an area incapable of sustaining vegetation due to lack of light. Any vegetation removed during the construction process will be replanted with native vegetation, so there could be a slight increase in riparian habitat quality.	N/A	N/A	Maintain

In summary, NOAA Fisheries expects temporary increases in suspended sediment/turbidity to result from in-water work associated with the proposed action. Operating machinery in and near the stream introduces risks of chemical pollutants entering the waterway. NOAA Fisheries expects that these effects will be localized and will subside upon completion of construction. There is also a risk of direct harm to UWR chinook salmon and steelhead due to operation of machinery in the creek and during the capture and release effort behind the cofferdam. The City has proposed numerous conservation measures, which are part of the USACE's proposed action, to minimize these risks. Finally, because the new fish ladder will enhance passage conditions, the project will result in long-term improvement over baseline conditions for that important habitat element. The long-term effect of this project will be substantially improved fish passage in Pringle Creek.

1.5.5 Cumulative Effects

Cumulative effects are defined in 50 CFR 402.02 as those effects of "future State or private activities, not involving Federal activities, that are reasonably certain to occur within the action area of the Federal action subject to consultation." Future Federal actions, including the ongoing operation of hydropower systems, hatcheries, fisheries, and land management activities are reviewed through separate Section 7 consultation processes. Therefore, these actions are not considered cumulative to the proposed action. It is likely that additional urban development in the Pringle Creek basin will facilitate construction of additional roads, buildings, and industrial complexes within the action area that could further degrade habitat of listed salmonids. However, NOAA Fisheries is not aware of any specific future non-Federal activities within the action area that would affect the listed species or their habitat.

1.6 Conclusion

NOAA Fisheries has determined, based on the available information, that the proposed action covered in this BO is not likely to jeopardize the continued existence of listed salmonids. NOAA Fisheries used the best available scientific and commercial data to apply its jeopardy analysis, analyzing the effects of the proposed action on the biological requirements of the species relative to the environmental baseline, together with cumulative effects. This finding is based, in part, on the USACE's incorporation of numerous conservation measures into the proposed permit for the construction activities. NOAA Fisheries believes that any construction-related adverse effects will be temporary and that the proposed action will improve long-term passage conditions for listed species in the Pringle Creek watershed.

1.7 Conservation Recommendations

Section 7(a)(1) of the ESA directs Federal agencies to use their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of the threatened and endangered species. Conservation recommendations are discretionary measures suggested to minimize or avoid adverse effects of a proposed action on listed species, to minimize or avoid adverse modification of critical habitat, or to develop additional information. NOAA Fisheries believes the following conservation recommendation is consistent with these obligations, and therefore should be carried out by the USACE:

1. That the City of Salem continue efforts to enhance habitat in Pringle Creek from the Commercial Street Bridge weir downstream to its confluence with the Willamette River (as recommended in Black and Veatch Corporation and Craven Consulting [2002]). Black and Veatch Corporation and Craven Consulting (2002) recommended expanding the channel in this reach by removing a portion of a retaining wall downstream from the project. This would allow the channel to widen, thereby reducing the erosive potential of the concentrated streamflow.

1.8 Reinitiation of Consultation

This concludes formal consultation on these actions in accordance with 50 CFR 402.14(b)(1). As provided in 50 CFR 402.16, reinitiation of consultation is required: (1) if the amount or extent of incidental take is exceeded, (2) if the action is modified in a way that causes an effect on the listed species that was not previously considered in the BA and this BO, (3) if new information or project monitoring reveals effects of the action that may affect the listed species in a way not previously considered, or (4) a new species is listed or critical habitat is designated that may be affected by the action (50 CFR 402.16).

2. INCIDENTAL TAKE STATEMENT

Section 9 and rules promulgated under Section 4(d) of the ESA prohibit any taking (harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or attempt to engage in any such conduct) of listed species without a specific permit or exemption. Harm is further defined to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns such as breeding, feeding, and sheltering. Harass is defined as actions that create the likelihood of injuring listed species by annoying it to such an extent as to significantly alter normal behavior patterns which include, but are not limited to, breeding, feeding, and sheltering. Incidental take is take of listed animal species that results from, but is not the purpose of, the Federal agency or the applicant carrying out an otherwise lawful activity. Under the terms of Section 7(b)(4) and Section 7(o)(2), taking that is incidental to, and not intended as part of, the agency action is not considered prohibited taking provided that such taking is in compliance with the terms and conditions of this incidental take statement.

An incidental take statement specifies the impact of any incidental taking of threatened species. It also provides reasonable and prudent measures that are necessary to minimize impacts and sets forth terms and conditions with which the action agency must comply in order to implement the reasonable and prudent measures.

2.1 Amount or Extent of the Take

NOAA Fisheries anticipates that the proposed action is reasonably certain to result in incidental take of UWR chinook salmon and steelhead because of the detrimental effects from the capture and release of fish within the in-water work area (non-lethal and lethal), disturbance due to in-water work (non-lethal), and increased sediment and possible pollutant levels (non-lethal).

Effects of actions such as the one covered by this BO are largely unquantifiable in the short term, and are not expected to be measurable as long-term effects on habitat or population levels. Therefore, even though NOAA Fisheries expects some low level incidental take to occur due to the construction actions covered by this BO (other than fish capture and release), the best scientific and commercial data available are not sufficient to enable NOAA Fisheries to estimate a specific amount of incidental take to the species itself. In instances such as these, NOAA Fisheries designates the expected level of take as "unquantifiable."

Effects of isolating the work area from the flowing waters of Pringle Creek could result in minor incidental lethal take of UWR chinook salmon or steelhead. Based on site-specific habitat and flow conditions, up to 50 juveniles and 5 adult steelhead or chinook salmon could be captured and released. Lethal take should be less than 10% (approximately 5 juveniles and 1 adult) due to implementation of the handling protocols described in Section 1.2.3.8.

2.2 Reasonable and Prudent Measures

NOAA Fisheries believes that the following RPMs are necessary and appropriate to minimize take of the above species. The USACE included the City's conservation measures in its proposed action that will reduce the amount of take associated with this project. These RPMs and the Terms and Conditions in Section 2.3 reflect the content of the USACE's conservation measures, but provide additional detail and include project-specific conditions to minimize take. The USACE shall include permit provisions to ensure that the City shall:

1. Minimize the likelihood of incidental take associated with in-stream work by restricting in-water work to the in-water work period recommended by ODFW.

2. Minimize the likelihood of incidental take by ensuring that fish passage (both upstream and downstream) is provided in the project area both during and after construction of this project.

3. Minimize the likelihood of incidental take associated with fish salvage/capture and release during dewatering by implementing the guidelines in NMFS (2002) to avoid or minimize fish injury and mortality.

4. Minimize the likelihood of incidental take and alteration of habitat associated with construction-related erosion and chemical contamination by ensuring that effective pollution and erosion control measures are developed and implemented.

5. Minimize the likelihood of incidental take and alteration of habitat from general construction practices by ensuring that construction practices are designed to limit the affected area to the minimum necessary to complete the project, by implementing responsible construction techniques, and by proper site restoration.

6. Monitor the effectiveness of the proposed conservation measures in minimizing incidental take and report the results to NOAA Fisheries.

7. Minimize the likelihood of incidental take resulting from an improperly-functioning fish ladder by developing and implementing a plan to inspect and maintain the new fish ladder.

2.3 Terms and Conditions

1. To implement RPM #1 (in-water work), the USACE shall include permit provisions to ensure that:

a. In-water work. All in-water work shall be completed within the ODFW-approved in-water work period. For this project area, the in-water work window is from June 1, 2003 through September 30, 2003.

b. Extensions. Any extensions to the in-water work period must be approved by ODFW and NOAA Fisheries.

2. To implement RPM #2 (fish passage), the USACE shall include permit provisions to ensure that:

a. Pringle Creek and Shelton Ditch streamflow. Flows in the Pringle Creek and Shelton Ditch (to the extent they can be controlled through Shelton Ditch and the Mill Race) are adequate to allow both upstream and downstream passage through the project area. Adequate flows are expected to be approximately 10 to 20 cfs in the project area.

b. Upstream passage. While flow is diverted around the cofferdam during Phase I of construction of the fish ladder, a notch is constructed in the existing weir to allow upstream fish passage over the weir. The notch should measure approximately 18 in. deep and 4 ft wide. The plunge pool downstream of the notch shall be at least 1.5 times the height of the jump (1.5 times the difference in water surface elevation over the weir at the location of the notch).

c. Temporary stream crossing design. A temporary stream crossing shall be constructed if the stream is to be crossed by construction equipment more than twice daily (once over and once back). The temporary crossing shall consist of a temporary bridge (e.g., using timber or I-beams spanning ecology blocks). If a temporary bridge is not possible, then the crossing shall consist of large-diameter culverts through a temporary dam. The crossing shall be constructed in an area of relatively slow water velocity to enable fish passage through the structure. The USACE shall ensure that the City notify NOAA Fisheries if a temporary crossing using culverts is to be constructed so that NOAA Fisheries can inspect and approve the crossing. Additional conditions regarding temporary stream crossings are discussed in Term and Condition 5.(e.)(iv).

d. Hydraulic evaluation. The City shall provide verification to NOAA Fisheries that the new fish ladder was constructed to meet the design specifications. The City will evaluate the hydraulic conditions in the ladder by measuring velocity and depth. If the hydraulic conditions do not meet design specifications, the City will develop and implement modifications to correct the problem until NOAA Fisheries agrees that the design specifications have been achieved.

3. To implement RPM #3 (fish capture and release), the USACE shall ensure that:

a. Capture and release. Before and intermittently during pumping to isolate an in-water work area, an attempt must be made to capture and release fish from the isolated area using trapping, seining, electrofishing, or other methods as are prudent to minimize risk of injury. The following conditions shall be met:

   i. A fishery biologist experienced with work area isolation and competent to ensure the safe handling of all ESA-listed fish must conduct or supervise the entire capture and release operation.
   ii. If electrofishing equipment is used to capture fish, the capture team must comply with NOAA Fisheries' electrofishing guidelines.[5]
   iii. The capture team must handle ESA-listed fish with extreme care, keeping fish in water to the maximum extent possible during seining and transfer procedures to prevent the added stress of out-of-water handling.
   iv. Captured fish must be released as near as possible to capture sites.
   v. ESA-listed fish may not be transferred to anyone except NOAA Fisheries personnel, unless otherwise approved in writing by NOAA Fisheries.
   vi. Other Federal, state, and local permits necessary to conduct the capture and release activity must be obtained.
   vii. NOAA Fisheries or its designated representative must be allowed to accompany the capture team during the capture and release activity, and must be allowed to inspect the team's capture and release records and facilities.

4. To implement RPM #4 (pollution and erosion control), the USACE shall ensure that:

a. Pollution and Erosion Control Plan. A PECP will be prepared and carried out to prevent pollution related to construction operations. The plan must be available for inspection on request by USACE and NOAA Fisheries.

   i. Plan contents. The pollution and erosion control plan must contain the pertinent elements listed below, and meet requirements of all applicable laws and regulations.
      (1) Practices to prevent erosion and sedimentation associated with access roads, stream crossings, construction sites, borrow pit operations, haul roads, equipment and material storage sites, fueling operations, and staging areas.

      (2) Practices to confine, remove and dispose of excess concrete, cement, and

[5] National Marine Fisheries Service, *Backpack Electrofishing Guidelines* (December 1998) (http://www.nwr.noaa.gov/1salmon/salmesa/pubs/electrog.pdf).

other mortars or bonding agents, including measures for washout facilities.

(3) A description of any hazardous products or materials that will be used for the project, including procedures for inventory, storage, handling, and monitoring.

(4) A spill containment and control plan with notification procedures, specific clean-up and disposal instructions for different products, quick response containment and clean-up measures that will be available on the site, proposed methods for disposal of spilled materials, and employee training for spill containment.

(5) Practices to prevent construction debris from dropping into any stream or water body, and to remove any material that does drop with a minimum disturbance to the streambed and water quality.

ii. Inspection of erosion controls. During construction, all erosion controls must be inspected daily during the rainy season and weekly during the dry season to ensure they are working adequately.[6]

(1) If inspection shows that the erosion controls are ineffective, work crews must be mobilized immediately to make repairs, install replacements, or install additional controls as necessary.

(2) Sediment must be removed from erosion controls once it has reached one-third of the exposed height of the control.

b. Additional monitoring. Given that the staging area for this construction area will be located within 150 ft of the stream, the USACE shall ensure that the City:

i. Performs random site inspections by a third-party inspector (i.e., not the regular inspector) every other week in addition to regularly-scheduled site inspections to ensure thorough enforcement of environmental measures in the PECPs.

ii. Provide NOAA Fisheries with brief summaries of the results of these visits (via email), including identification of contractor violations and the corrective measures taken.

5. To implement RPM #5 (responsible construction practices), the USACE shall ensure that:

a. Cessation of work. Project operations will cease under high flow conditions that may result in inundation of the project area, except for efforts to avoid or minimize resource damage.

b. Fish screens. All water intakes used for a project, including pumps used to isolate an in-water work area, will have a fish screen installed, operated, and maintained according to

[6]"Working adequately" means no turbidity plumes are evident during any part of the year.

NOAA Fisheries' fish screen criteria.[7] After the City effectively captures and releases all fish from the area behind the cofferdam, the City may remove the screen on their pump intake. The screen shall be reinstalled if for any reason water that could contain fish enters the dewatered area (e.g., from a breached, overtopped, or compromised cofferdam).

c. Construction discharge water. All discharge water created by construction (e.g., concrete washout, pumping for work area isolation, vehicle wash water) will be treated as follows:
   i. Water quality. Facilities must be designed, built, and maintained to collect and treat all construction discharge water using the best available technology applicable to site conditions. The treatment must remove debris, nutrients, sediment, petroleum hydrocarbons, metals, and other pollutants likely to be present.
   ii. Discharge velocity. If construction discharge water is released using an outfall or diffuser port, velocities must not exceed 4 ft per second.
   iii. Spawning areas. No construction discharge water may be released within 300 ft upstream of active spawning area.

d. Preconstruction activity. Before significant [8] alteration of the project area, the following actions must be completed:
   i. Marking. Flag the boundaries of clearing limits associated with site access and construction to prevent ground disturbance of critical riparian vegetation, wetlands, and other sensitive sites beyond the flagged boundary.
   ii. Emergency erosion controls. Ensure that the following materials for emergency erosion control are on-site.
      (1) A supply of sediment control materials (e.g., silt fence, straw bales[9]).
   iii. Temporary erosion controls. All temporary erosion controls must be in-place and appropriately installed downslope of project activity within the riparian area until site restoration is complete.

e. Temporary access roads.
   i. Existing ways. Existing roadways or travel paths must be used whenever

[7]National Marine Fisheries Service, *Juvenile Fish Screen Criteria* (revised February 16, 1995) and *Addendum: Juvenile Fish Screen Criteria for Pump Intakes* (May 9, 1996) (guidelines and criteria for migrant fish passage facilities, new pump intakes, and existing inadequate pump intake screens) (http://www.nwr.noaa.gov/1hydrop/hydroweb/ferc.htm).

[8]"Significant" means an effect can be meaningfully measured, detected or evaluated.

[9]When available, certified weed-free straw or hay bales must be used to prevent introduction of noxious weeds.

possible, unless construction of a new way would result in less habitat take.

ii. Steep slopes. Temporary roads built mid-slope or on slopes steeper than 30% are not authorized.

iii. Minimizing soil disturbance and compaction. When a new temporary road is necessary within 150 ft[10] of a stream, water body, or wetland, soil disturbance and compaction must be minimized by clearing vegetation to ground level and placing clean gravel over geotextile fabric, unless otherwise approved in writing by NOAA Fisheries. This requirement does not apply to the temporary road that will be constructed underneath the Boise Cascade Building and Commercial Street Bridge in locations where the road can be constructed on existing cobble or gravel material. See Term and Condition 5.d.v.(2) below regarding obliteration of the temporary access road under the Boise Cascade Building.

iv. Temporary stream crossings.

(1) The number of temporary stream crossings must be minimized.

(2) Temporary road crossings must be designed as follows:

(a) A survey must identify and map any potential spawning habitat within 300 ft downstream of a proposed crossing.

(b) No stream crossing may occur at known or suspected spawning areas, or within 300 ft upstream of such areas if spawning areas may be affected.

(c) The crossing design must provide for foreseeable risks (e.g., flooding and associated bedload and debris) to prevent the diversion of streamflow out of the channel and down the road if the crossing fails.

(d) Vehicles and machinery must cross riparian areas and streams at right angles to the main channel wherever possible.

(e) See additional conditions regarding temporary stream crossings in Term and Condition 2c.

v. Obliteration. When the project is completed, all temporary access roads and stream crossing structures (bridges or culverts) must be obliterated, the soil must be stabilized, and the site must be revegetated.

(1) It is not necessary to revegetate the access road underneath the Commercial Street Bridge in areas where no vegetation existed prior to construction.

(2) In the area under the Boise Cascade Building where the temporary access

[10]Distances from a stream or water body are measured horizontally from, and perpendicular to, the bankfull elevation, the edge of the channel migration zone, or the edge of any associated wetland, whichever is greater. "Channel migration zone" means the area defined by the lateral extent of likely movement along a stream reach as shown by evidence of active stream channel movement over the past 100 years, e.g., alluvial fans or floodplains formed where the channel gradient decreases, the valley abruptly widens, or at the confluence of larger streams.

road was constructed on cobble or gravel adjacent to the stream, the gravel and cobble must be loosened at the conclusion of construction to avoid excessive compaction.

(3) Temporary roads in wet or flooded areas must be abandoned and restored as necessary by the end of the in-water work period.

f. Heavy Equipment. Use of heavy equipment will be restricted as follows:

i. Choice of equipment. When heavy equipment must be used, the equipment selected must have the least adverse effects on the environment (e.g., minimally-sized, rubber-tired).

ii. Vehicle staging. Vehicles must be fueled, operated, maintained and stored as follows:

(1) All vehicles operated within 150 ft of any stream, water body or wetland must be inspected daily for fluid leaks before leaving the vehicle staging area. Any leaks detected must be repaired in the vehicle staging area before the vehicle resumes operation. Inspections must be documented in a record that is available for review on request by USACE or NOAA Fisheries.

(2) All equipment operated instream must be cleaned before beginning operations below the bankfull elevation to remove all external oil, grease, dirt, and mud.

iii. Stationary power equipment. Stationary power equipment (e.g., generators, cranes) operated within 150 ft of any stream, water body, or wetland must be diapered to prevent leaks, unless otherwise approved in writing by NOAA Fisheries.

g. Site preparation. Native materials will be conserved for site restoration.

i. If possible, native materials must be left where they are found.

ii. Materials that are moved, damaged, or destroyed must be replaced with a functional equivalent during site restoration.

iii. Any large wood,[11] native vegetation, weed-free topsoil, and native channel material displaced by construction must be stockpiled for use during site restoration.

h. Isolation of in-water work area. If adult or juvenile fish are reasonably certain to be present, the work area will be well isolated from the active flowing stream using

[11] For purposes of this BO only, "large wood" means a tree, log, or rootwad big enough to dissipate stream energy associated with high flows, capture bedload, stabilize streambanks, influence channel characteristics, and otherwise support aquatic habitat function, given the slope and bankfull width of the stream in which the wood occurs. See Oregon Department of Forestry and Oregon Department of Fish and Wildlife, *A Guide to Placing Large Wood in Streams*, May 1995 (www.odf.state.or.us/FP/RefLibrary/LargeWoodPlacemntGuide5-95.doc).

inflatable bags, sandbags, sheet pilings, or similar materials. The work area will also be isolated if in-water work may occur within 300 ft upstream of spawning habitats.

i. Earthwork. Earthwork (including drilling, excavation, dredging, filling, and compacting) will be completed as quickly as possible.
   i. Site stabilization. All disturbed areas must be stabilized, including obliteration of temporary roads, within 12 hours of any break in work unless construction will resume work within 7 days between June 1 and September 30
   ii. Source of materials. Boulders, rock, woody materials, and other natural construction materials used for the project must be obtained outside the riparian area.
      (1) Any erodible elements of this system must be adequately stabilized to prevent erosion.
      (2) Surface water from the area must not be diverted from or increased to an existing wetland, stream, or near-shore habitat sufficient to cause a significant adverse effect to wetland hydrology, soils, or vegetation.

j. Site restoration. All streambanks, soils, and vegetation disturbed by the project are cleaned up and restored as follows:
   i. Restoration goal. The goal of site restoration is renewal of habitat access, water quality, production of habitat elements (such as large woody debris), channel conditions, flows, watershed conditions, and other ecosystem processes that form and maintain productive fish habitats.
   ii. Streambank shaping. Damaged streambanks must be restored to a natural slope, pattern, and profile suitable for establishment of permanent woody vegetation.
   iii. Revegetation. Areas requiring revegetation must be replanted before the first April 15 following construction with a diverse assemblage of species that are native to the project area or region, including grasses, forbs, shrubs, and trees. Revegetation is not required underneath the Commercial Street Bridge or the Boise Cascade Building since there is not adequate light to sustain vegetation.
   iv. Pesticides. No pesticide application is allowed, although mechanical or other methods may be used to control weeds and unwanted vegetation.
   v. Fertilizer. No surface application of fertilizer may occur within 50 ft of any stream channel.
   vi. Fencing. Fencing must be installed as necessary to prevent access to revegetated sites by livestock or unauthorized persons.
   vii. Long-term adverse effects. Long-term adverse effects will be avoided or offset after taking all appropriate steps to avoid or minimize short-term adverse effects.
      (1) Design review. The USACE must review and approve designs to avoid or offset long-term adverse effects by applying the following considerations:
         (a) Use of an ecosystem approach.

(b) Habitat requirements of the affected species.
(c) Productive capacity of the proposed construction and compensation site(s).
(d) Timing of the construction and compensation actions.
(e) Length of time necessary to achieve full functionality.
(f) The likelihood of success.

6. To implement RPM #6 (monitoring and reporting) the USACE shall ensure that:

a. Implementation monitoring. The applicant submits a monitoring report to NOAA Fisheries within 120 days of project completion describing success meeting these terms and conditions. The monitoring report will include the following information:
   i. Project identification.
      (1) Permittee name, consultation number, and project name.
      (2) Type of activity.
      (3) Project location.
      (4) Contact person.
      (5) Starting and ending dates for work completed.
   ii. Narrative assessment. A narrative assessment of the project's effects on natural stream function.
   iii. Photo documentation. Photo of habitat conditions at the project and any compensation site(s), before, during, and after project completion.[12]
      (1) Include general views and close-ups showing details of the project and project area, including pre- and post-construction.
      (2) Label each photo with date, time, project name, photographer's name, and a comment about the subject.
   iv. Other data. Additional project-specific data, as appropriate for individual projects.
      (1) Work cessation. Dates work cessation was required due to high flows.
      (1) Fish screen. Compliance with NOAA Fisheries' fish screen criteria.
      (2) Pollution and Erosion Control Inspections. A summary of pollution and erosion control inspections, including any erosion control failure, hazardous material spill, and correction effort.
      (3) Site preparation.
         (a) Total cleared area – riparian and upland.
         (b) Total new impervious area.

      (4) Isolation of in-water work area, capture and release.

[12] Relevant habitat conditions may include characteristics of channels, eroding and stable streambanks in the project area, riparian vegetation, water quality, flows at base, bankfull and over-bankfull stages, and other visually discernable environmental conditions at the project area, and upstream and downstream of the project.

(a) Supervisory fish biologist – name and address.
(a) Methods of work area isolation and take minimization.
(b) Stream conditions before, during, and within one week after completion of work area isolation.
(c) Means of fish capture.
(d) Number of fish captured by species.
(e) Location and condition of all fish released.
(f) Any incidence of observed injury or mortality.

(2) Site restoration.

(a) Finished grade slopes and elevations.
(b) Planting composition and density.

ii. Submit monitoring reports to:

NOAA Fisheries Hydropower Division
Attn: Mindy Simmons
525 NE Oregon Street, Suite 500
Portland, OR 97232-2778

b. Encounters with listed species. If a dead, injured, or sick endangered or threatened species specimen is located, initial notification must be made to the NOAA Fisheries Law Enforcement Office, located at Vancouver Field Office, 600 Maritime, Suite 130, Vancouver, Washington 98661; phone 360-418-4246. Care will be taken in handling sick or injured specimens to ensure effective treatment and in the handling of dead specimens to preserve biological material in the best possible state for later analysis of cause of death. In conjunction with the care of sick or injured endangered and threatened species or preservation of biological materials from a dead animal, the finder has the responsibility to carry out instructions provided by Law Enforcement to ensure that evidence intrinsic to the specimen is not unnecessarily disturbed.

7. To implement RPM #7 (fish ladder maintenance), the USACE shall ensure that:

a. Fish Ladder Maintenance Plan. Within 90 days after completing construction, the City shall submit a Fish Ladder Maintenance Plan to NOAA Fisheries for monitoring and maintaining proper hydraulic conditions within the fish ladder. The plan should describe:

i. When the ladder will be inspected (e.g., annually in the spring).
ii. Removal procedures for obstructions that affect the hydraulic conditions within the ladder, including gravel accumulation in the pools.
iii. A schedule for reporting the results of inspections and obstruction removal.

3. MAGNUSON-STEVENS ACT

3.1 Background

The Magnuson-Stevens Fishery Conservation and Management Act (MSA), as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-267), established procedures designed to identify, conserve, and enhance EFH for those species regulated under a Federal fisheries management plan. Pursuant to the MSA:

- Federal agencies must consult with NOAA Fisheries on all actions, or proposed actions, authorized, funded, or undertaken by the agency, that may adversely affect EFH (§305(b)(2)).
- NOAA Fisheries must provide conservation recommendations for any Federal or State action that would adversely affect EFH (§305(b)(4)(A)).
- Federal agencies must provide a detailed response in writing to NOAA Fisheries within 30 days after receiving EFH conservation recommendations. The response must include a description of measures proposed by the agency for avoiding, mitigating, or offsetting the impact of the activity on EFH. In the case of a response that is inconsistent with NOAA Fisheries' EFH conservation recommendations, the Federal agency must explain its reasons for not following the recommendations (§305(b)(4)(B)).

EFH means those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity (MSA §3). For the purpose of interpreting this definition of EFH, waters include aquatic areas and their associated physical, chemical, and biological properties that are used by fish and may include aquatic areas historically used by fish where appropriate; substrate includes sediment, hard bottom, structures underlying the waters, and associated biological communities; necessary means the habitat required to support a sustainable fishery and the managed species' contribution to a healthy ecosystem; and spawning, breeding, feeding, or growth to maturity covers a species' full life cycle (50 CFR 600.10). Adverse effect means any impact which reduces quality and/or quantity of EFH, and may include direct (e.g., contamination or physical disruption), indirect (e.g., loss of prey or reduction in species fecundity), site-specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions (50 CFR 600.810).

EFH consultation with NOAA Fisheries is required regarding any Federal agency action that may adversely affect EFH, including actions that occur outside EFH, such as certain upstream and upslope activities.

The objectives of this EFH consultation are to determine whether the proposed action would adversely affect designated EFH and to recommend conservation measures to avoid, minimize, or otherwise offset potential adverse effects to EFH.

3.2 Identification of EFH

Pursuant to the MSA, the Pacific Fisheries Management Council (PFMC) has designated EFH for three species of Federally-managed Pacific salmon: chinook (*Oncorhynchus tshawytscha*); coho (*O. kisutch*); and Puget Sound pink salmon (*O. gorbuscha*) (PFMC 1999). Freshwater EFH for Pacific salmon includes all those streams, lakes, ponds, wetlands, and other water bodies currently, or historically accessible to salmon in Washington, Oregon, Idaho, and California, except areas upstream of certain impassable man-made barriers (as identified by the PFMC 1999), and longstanding, naturally-impassable barriers (i.e., natural waterfalls in existence for several hundred years). Detailed descriptions and identifications of EFH for salmon are found in Appendix A to Amendment 14 to the Pacific Coast Salmon Plan (PFMC 1999). Assessment of potential adverse effects to these species' EFH from the proposed action is based, in part, on this information.

3.3 Proposed Action

The proposed action is detailed above in Section 1.2. The action area for this consultation includes the streambed and streambank of Pringle Creek within the area of disturbance at the project site and downstream to the extent of visible short-term turbidity increases resulting from the project work. This action area includes habitats that have been designated as EFH for chinook salmon and coho salmon.

3.4 Effects of Proposed Action

As described in detail in Section 1.5 of this BO, the proposed action may result in adverse effects to a variety of habitat parameters. NOAA Fisheries expects temporary increases in suspended sediment/turbidity to result from in-water work associated with the proposed action. Additionally, operating machinery in and near the stream introduces risks of chemical pollutants entering the waterway. Finally, there is a risk of direct harm due to operation of machinery in the creek, as well as during the capture and release effort during dewatering. The City has proposed numerous conservation measures to minimize these risks. In addition, the long-term effect of this project will be substantially improved fish passage in the Pringle Creek.

3.5 Conclusion

NOAA Fisheries believes that construction of the Commercial Street Bridge weir and fish ladder on Pringle Creek would adversely affect designated EFH for chinook salmon and coho salmon.

3.6 EFH Conservation Recommendations

Pursuant to Section 305(b)(4)(A) of the MSA, NOAA Fisheries is required to provide EFH conservation recommendations to Federal agencies regarding actions which may adversely affect

EFH. While NOAA Fisheries understands that the conservation measures described in the BA will be implemented by the USACE, it does not believe that these measures are sufficient to address the adverse impacts to EFH described above. However, the Terms and Conditions outlined in Section 2.3 are generally applicable to designated EFH for chinook salmon and address these adverse effects. Consequently, NOAA Fisheries recommends that they be adopted as EFH conservation measures.

3.7 Statutory Response Requirement

Pursuant to the MSA (§305(b)(4)(B)) and 50 CFR 600.920(j), Federal agencies are required to provide a detailed written response to NOAA Fisheries' EFH conservation recommendations within 30 days of receipt of these recommendations. The response must include a description of measures proposed to avoid, mitigate, or offset the adverse impacts of the activity on EFH. In the case of a response that is inconsistent with the EFH conservation recommendations, the response must explain the reasons for not following the recommendations, including the scientific justification for any disagreements over the anticipated effects of the proposed action and the measures needed to avoid, minimize, mitigate, or offset such effects.

3.8 Supplemental Consultation

The USACE must reinitiate EFH consultation with NOAA Fisheries if either the action is substantially revised or new information becomes available that affects the basis for NOAA Fisheries' EFH conservation recommendations (50 CFR 600.920).

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